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Special Issue: Native Food Production Knowledge Systems and Practices: Alternative Values and Outcomes-From the guest editors

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From the guest editors

Regular readers of this journal need no reminder of how thoroughly human values permeate agricultural technology or how they consequently impact issues of social equity and environmental sustainability. The contributors to this special issue all evaluate some aspect of native ecologies – that is, the heterogeneous ecological knowledge systems and practices involved in the food production of groups that have lived in their particular places for many generations. Such native ecologies can involve values quite different than those of the pervasive and largely homogenous, modern agriculture of the West. And such native ecologies might, therefore, be key to addressing social and environmental challenges such as world hunger and the Greenhouse Effect.

The following papers focus on that potential. They derive from a symposium of the 50th meeting of the International Congress of Americanists (ICA) and therefore concern the Americas, although the relevance is more general. The multidisciplinary scope of the ICA encouraged a symposium that brought together anthropologists, archaeologists, biologists, soil scientists, sociologists, historians, and geographers who have long been studying native ecologies but from fairly distinct disciplinary perspectives. In all, scholars from nine countries representing seven disciplines delivered thirty-two papers in Warsaw, Poland between 10 and 14 July 2000 on research ranging from North America to South America. The ensuing discussions revealed many common concerns among all that diversity. In particular, as intended when originally conceived, by providing a common focus on the application of native ecologies to issues of social equity and environmental sustainability, the symposium bridged the major divide between those who study past versus contemporary native ecologies. The symposium title conveyed that particular concern: "Native American Ecologies: Past, Present, and Future."

This essay introduces those thirteen of the ICA papers that have found space in this collection but echoes the discussions held and conclusions reached over the course of the symposium on the basis of all its presentations (program and abstracts available from the first author). The following papers intentionally preserve the intellectual diversity – rooted in differing nationalities, ethnicities, ages, classes, genders, and disciplinary literatures and theoretical frameworks – that so enlivened the symposium. At the same time, though, this introductory essay strives to convey some of the commonalities that emerged, unifying the contributions without sacrificing the valuable heterogeneity of the authors and of the native ecologies they interpret.

The first group of papers presents case studies of contemporary native ecologies, in which direct observation can render detailed characteristics discernable. Most basically, the authors emphasize that native ecologies differ fundamentally from and provide useful alternatives to modern agriculture, reflecting the conclusions of a much larger literature (Wilken, 1987; Clay, 1988; Netting, 1993; Altieri, 1995; Zimmer and Bassett, 2003). Native ecologies achieve high productivity, efficiency, and sustainability through integration with dynamic, heterogeneous environmental forms and processes, in contrast to the tendency of modern agriculture to obliterate and homogenize environmental complexity. Typical characteristics of such integration include detailed knowledge of local plants, animals, soils, and their interactions; maintenance of biodiversity, polyculture, and the use of native plants; minimal tillage, recycling, and biological pest and weed control; and continuous innovation. Moreover, because native ecologies are dynamically integrated with environments, they by definition sustain and conserve one another. The recent emergence of a "new" ecology that values understanding the histories and spatial heterogeneities of ecosystems has led to the institutionalization of applied paradigms, such as adaptive ecosystem management, that value and aspire to replicate the dynamism, particularism, and holism of native ecologies (Botkin, 1990; Aley et al., 1999). Even international development agencies such as the United Nations (UN) have codified the value of native ecologies (UN, 1992, 1993).

> Indigenous people and their communities have an historical relationship with their lands and are generally descendants of the original inhabitants of such lands . . . . They have developed over many generations a holistic traditional scientific knowledge of their lands, natural resources and environment . . . . In view of the interrelationship between the natural environment and its sustainable development and the cultural, social, economic and physical well-being of indigenous people, national and international efforts to implement environmentally sound and sustainable development should recog-

> nize, accommodate, promote and strengthen the role of indigenous people and their communities (UN, 1993: 227).

With hindsight, then, the dynamic, intricate fit between local environments and native ecologies is beginning to seem more appropriate than the attempts of the central development and conservation planners to impose homogeneity and equilibrium.

The following six contemporary case studies, individually and collectively through their geographical and thematic diversity, well illustrate the dynamism and heterogeneity of such native ecologies. Sandra Turbay's paper echoes a broader literature that has begun to elaborate the ways in which native peoples systematically classify plants and animals in ways that reflect values often quite different than those implicit in modern taxonomies. The people of the Momposina wetlands of the Caribbean coast of South America, among whom Turbay has worked, classify animals, for example, primarily on the basis of their habitats, perhaps a more useful perspective for environmental conservation than modern taxonomists' focus on morphologies and phylogenetic relationships. Marta Crivos and colleagues present some aspects of the detailed, systematic, dynamic knowledge that the Mbyá-Guaraní people have developed of their local environments in the South American subtropics. The case study of Nahua farmers in central Mexico by Paul Hersch-Martínez, Lilián González-Chévez, and Andrés Fierro Alvarez illustrates a major difference between native ecological knowledges and practices versus modern agronomy: the former tends not to dichotomize the social from the natural; the latter relies on doing so and thereby creates what Bruno Latour calls natural/social hybrids such as the Green Revolution and the Greenhouse Effect, which threaten society more than nature alone ever could (Latour, 1993; Sluyter, 2002: 220–231). Antoinette Winkler-Prins and Narciso Barrera-Bassols actually provide more than a single case study, choosing instead to review case studies drawn from the scattered multidisciplinary literature on sophisticated native knowledges and practices related to soils from throughout the Americas. Based on research in Idaho, Hiroaki Kawamura concludes that Nez Perce hunting, fishing, and gathering comprise far from a static body of "traditional" knowledge undergoing continuous erosion as other economic activities provide a greater proportion of calorie, nutrition, and economic capital. Instead, hunting, fishing, and gathering undergo continuous reinvention as the social and environmental context changes, most recently becoming valued as the primary means to accumulate symbolic capital. David Carr systematically compares differences in land use between Q'eqchí Maya and Spanish-speaking farmers in the Sierra de Lacandón of Guatemala, a region undergoing rapid deforestation. Both groups are recent migrants to the region and have established similar mixed farming practices despite very different ones in their places of origin. Carr's analysis emphasizes that native ecologies have more to do with belonging to a particular place than to a particular ethnicity (Jackson, 1994).

The second group of papers presents case studies of past native ecologies. Many became obliterated during the colonization of the Americas, as native population fell from some fifty million to a tenth of that between 1492 and 1650 (Denevan, 1992a, b; Sluyter, 2002). Yet, enough evidence survives to demonstrate that the contemporary native ecologies of the foregoing case studies no more than faintly echo what once was. That evidence, interpreted in part with analogs derived from contemporary case studies, allows some reconstruction of the specific details of past native ecologies and the development of general models of their forms and functions. Since native ecologies in many places sustained much higher populations in precolonial times than at present, and did so for many centuries, those specific details and general models might well provide the most useful alternatives to modern agriculture (Denevan, 1995).

The following seven papers provide some intriguing examples of both details and models, emphasize how extensive in space and time native ecologies once were, and increase understanding of the spectrum of knowledges and practices over those revealed by the contemporary case studies. Yet the papers also reveal that we know much less than we could about the native ecologies of the past and that many of the details and some of the basics will probably remain unknowable. William Doolittle convincingly demonstrates that even a fundamental, long established belief about native ecologies can be quite wrong. He argues that precolonial food production in the Eastern Woodlands of North America was not, as has been axiomatic among scholars for so long, based on shifting, slash-and-burn agriculture. Instead, native agricultural fields tended to be large, numerous, contiguous, well cleared, and permanently cultivated. Phil Crossley also challenges a conventional wisdom, but about the highly productive *chinampa* agriculture of central Mexico – so prominent when the conquistadors arrived, so marginalized now, yet such a tempting model for current development efforts (Gómez-Pompa et al., 1982). He argues that subirrigation through infiltration of water from the canals adjacent to fields into the root zone was not a primary reason for the productivity of the *chinampas*. Scott L. Fedick and Bethany A. Morrison report on a previously unknown practice among the ancient Maya, the addition

of soil and algae mined from wetlands to upland agricultural soils in a region that supported a much higher population precolonially than at present. Alba González Jácome provides a synopsis of fragments of the native ecological knowledge of precolonial Mexico gleaned from a sixteenth-century Nahuatl dictionary and thereby demonstrates that drawing on a broad range of types of data might yet reveal much more about past native ecologies. In contrast, David Aagesen's attempt to determine the role of native burning in the historical ecology of the monkey-puzzle tree of the southern Andes emphasizes the difficulty of reaching definitive conclusions regarding even basic questions with significant consequences to current environmental policy. Alfred Siemens, nonetheless, is able to illustrate the sort of general model of a past native ecological practice that is possible, even based on still tentative understanding of many details, and that can usefully address current social and environmental challenges related to food production. Lastly, William Woods explicates the native ecology of the precolonial city of Cahokia, near Saint Louis, which despite sustaining a dense population for three centuries ultimately proved unsustainable.

Ending the case studies with one that suggests that native ecologies are far from a panacea for the ailings of modern agriculture should remind us all that *any* model *can* be perniciously seductive (Sluyter, 2002: 204–209). One of the primary lessons learned from the study of native ecologies is that models, whether derived from modern agronomy or native ecologies, past or contemporary, are likely to fail unless they develop in place, in dynamic relation to the changing intricacies of environment and society (Jackson, 1994). Centralized experts can, however, make at least two contributions to that process. Experts on native ecologies can offer as raw material for dynamic integration into a particular native ecology some of the specific details and general models gleaned from the study of diverse native ecologies. Experts in agronomy can offer techniques, such as those used to facilitate breeding of crops based on native plants, as tools to enhance the dynamism of native ecologies (Finkel, 1999). Farmers who are trying to remain or become native to their places can in that way draw on global resources and expertise to help them do so, as opposed to modern agriculture and its inherent human values homogenizing and eliminating the dynamism of local idiosyncrasies under the guise of supposedly value-free rationalism.

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